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ABSTRACT

This publication is intended to assist local boards of education, superintendents, and staff in the organization and development of educational specifications. It was written because most educators have little knowledge about the purpose, process, organization, or contents of the finished product (educational specifications). It provides a conceptual background and suggested organizational framework for the content of the completed document. Part 1 offers a conceptual and operating primer on what educational specifications are, why they are developed, how they are organized, and who should be involved and in what way (professional staff, parents, students, auxiliary services personnel, design professionals, and educational consultants). Part 2 offers more specific information on the organization and content of the educational specifications document, including an introduction and background, general design considerations, and educational activities and user requirements. It includes a skeleton for the specifications that will permit a high degree of flexibility for adaptation to the variations of local situations, while at the same time providing sufficient guidance for the educator who does not know where to start. Two appendixes present possible elementary and secondary school subcommittee organizations and planning data. (SM)

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The Development of

EDUCATIONAL SPECIFICATIONS

Published November 2002

Public Schools of North Carolina
State Board of Education
Department of Public Instruction

Division of School Support - School Planning
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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

FOREWORD

Once the decision to construct a new educational facility or to construct a major addition or renovation to an existing facility has been made, the first and perhaps most important step in the process of providing a facility that truly enhances the educational program is the development of educational specifications. With the approval of the board of education and with the assistance of staff and selected others, the superintendent of schools must assume the responsibility for the organization and supervision of the educational specifications project, as well as serve as liaison between the board of education, school staff, and the citizens of the community.

The above paragraph was taken from the PREFACE of the earlier publication entitled, "The Development of Educational Specifications", published by School Planning in 1975. This paragraph and much of the content of the earlier publication are still valid.

This publication is an attempt to update the earlier version and yet keep the basic organization of the information and the content that still applies intact. The earlier version was distributed in draft form to many North Carolina public school facility planners and educators and higher education professors teaching educational administration graduate courses for comments and suggestions. By the internet, we can today solicit input you may have that will enable us to further improve this publication and make the educational specifications process an even better tool to help architects and engineers to design schools that enhance the education of students in our state.

Phillip J. Kirk, Jr., Chair
State Board of Education

Michael E. Ward, State Superintendent
North Carolina Department of Public Instruction

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INTRODUCTION

This publication has been developed to assist local boards of education, superintendents, and staff in the organization and development of educational specifications. The responsibility for programming a new educational facility that may affect thousands of students and may cost in the millions of dollars is both an exciting and an humbling experience. In many instances, this challenge and, at the same time, wonderful opportunity, becomes the responsibility of educators who have had little or no experience with the educational specifications process or the product.

This guide was developed because most educators have little knowledge concerning either the purpose, the process, the organization, or the contents of the finished product called "educational specifications". The organization of this publication provides both a conceptual background and a suggested organizational framework for the content of the completed document.

Part I attempts to present a conceptual and operating primer on what educational specifications are; why they are developed; how they are organized; and who should be involved and how. Basically, Part I answers the questions What? Why? Who? and How?

Part II is designed to provide more specific information relative to the organization and content of the educational specifications document. In the past, the quality and quantity of the specifications content have varied greatly. Size has varied from two pages to several hundred pages; either extreme is ineffective for obvious reasons. The intent of Part II is to provide a skeleton for the specifications that will permit a high degree of flexibility for adaptation to the variations of local situations while, at the same time, providing sufficient guidance for the bewildered educator who "doesn't know where to start."

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Part I

Part I contains general information about educational specifications - the purpose, the process, the personnel, and the product. Participating in the development of educational specifications is both a challenge and a privilege that only a few people have the opportunity to experience. It is also a serious responsibility when one considers the many students and teachers who will be affected over the 50-year life expectancy of a school facility.

Whether the facility will have a positive, neutral, or negative effect on the educational process will depend to a large degree upon how effectively the educational specifications committee functions. The information contained in Part I is introductory and explanatory in nature. An attempt has been made to provide answers to the following questions:

- What are educational specifications?
- Why develop educational specifications?
- Who should be involved?
- What are the general responsibilities of those involved?
- How should the educational specifications document be organized?
- How are educational specifications developed?

WHAT ARE EDUCATIONAL SPECIFICATIONS?

DEFINITION

Educational specifications may be defined as a written means of communication between educators and design professionals. Through this medium educators describe the educational program and identify factors which affect learning and teaching, thus providing a data base for the architect to use in creating the building plans and specifications.

CHARACTERISTICS

Some characteristics of educational specifications are:

- They are the responsibility of the educators.
- They should be based on a predetermined educational program.
- They should state the educators' concept of facility and program needs and leave methods of satisfying the needs to the design professionals.
- They should be free of rigid prescriptions. They are concise and to the point.
- They are best developed through the involvement of educators, and community representatives.

WHY DEVELOP EDUCATIONAL SPECIFICATIONS?

MEANS OF COMMUNICATION

The primary purpose for developing educational specifications is to provide an effective means of communication between the educational agency and the design professions. In addition to written educational specifications, discussions and visits to existing facilities may greatly aid in communication and understanding. Hopefully, open and effective communications will result in a better facility.

MEANS OF SHAPING INDIVIDUAL THOUGHT AND REACHING A CONSENSUS

Another purpose for developing a set of educational specifications is to provide an opportunity for the staff to collect and to analyze pertinent information about many critical factors and to firm up their thinking with regard to:

- Services to students and community
- Philosophy and objectives of the school
- School organization
- Methods of instruction
- Program of studies
- Furniture and equipment
- Desired environment
- Utilization of space

Rarely will a collection of individuals agree regarding all of these variables. The educational specifications process provides a forum for discussion and debate. Through individual and group research, reading, visitation, and free discussion, a consensus should be achieved and communicated to the design professionals.

MEANS OF PUBLIC RELATIONS

Still another purpose for the development of educational specifications is to solicit the active involvement of the community. In the process of developing educational specifications, parents should be actively involved on committees or subcommittees, and citizens representing various community agencies should be contacted for information and opinions. This process provides a valuable medium through which the community may learn of the proposed plans and through which they may contribute to the project. An informed and actively involved community is more likely to be supportive than an uninformed, passive community.

MEANS OF CONTINUOUS AND FINAL EVALUATION

A fourth purpose served by educational specifications is that of evaluation. Written educational specifications provide a tangible statement against which the various stages of the design and construction process may be evaluated. A continuous dialogue should exist between the architect and the educators concerning the compatibility of the educational program and the facility. The document may also serve as a valuable instrument for evaluating the facility one or two years after occupancy. An effort should be made to determine if, in fact, the facility does what the educators said they wanted it to do.

WHO SHOULD BE INVOLVED?

PROFESSIONAL STAFF

If educational specifications are to accurately communicate both the activities that will occur in the proposed facility and the user requirements that are implied by those activities, teachers, principals, and supervisory staff responsible for planning and implementing the program must be represented on the steering committee. The insight and sensitivity to the program that must be housed and hopefully enhanced by the facility can best be provided by those who design and implement the program.

PARENTS

Since the school is a social institution the program and the facilities should reflect the needs of the community. To represent the community and to communicate to the public regarding the planning process, parents and various community representatives should be involved in making decisions that do not require professional expertise. These individuals can contribute substantially to the process in general ways and are usually quite willing to leave the description of the instructional program and user requirements up to the professional educators.

As is the case in most construction projects, local funds for capital outlay may be needed to finance the project or to supplement other sources of funds. The availability of local funds is directly related to the public support that exists for the project. If a number of parents and other community representatives are positively involved in developing educational specifications and in reviewing the various stages of the design, the necessary public support should be more easily and enthusiastically obtained than had the involvement not occurred.

STUDENTS

The clients of the schools - the students - have traditionally been consulted less in the development of educational specifications than any other group. This is difficult to justify since they are most affected by school facilities. While the involvement of students may be limited in

terms of substantive contributions, especially in elementary projects, student representatives help to translate the feelings of the student population concerning desirable and undesirable features of a school facility. Often they can suggest ideas overlooked by adults that are very important to students.

Perhaps the most valuable aspect of student involvement, however, is in the degree with which they are able to internalize the facility as belonging partly to them - not just to the board of education nor to the superintendent. As a result of positive representative involvement and the resultant sense of responsibility, students are more likely to adopt a constructive, protective attitude toward the school rather than a destructive and hostile attitude.

A word of caution is appropriate. It is better not to involve students at all than to invite their participation and then to ignore their contribution or, even worse, to patronize them. Informed and sensitive students are quick to recognize pseudo-involvement and hypocrisy; they are just as quick to react negatively to such an approach.

AUXILIARY SERVICES PERSONNEL

Central office personnel who maintain and operate the various support systems throughout each school unit have much insight into this part of planning a new facility. Technology, maintenance, plant operations, transportation and similar entities should be represented on the educational specifications committee.

DESIGN PROFESSIONALS

Due to increasing demands for school construction, rising costs, and changing programs the time-consuming process of developing complete educational specification documents before beginning the design process is becoming difficult to justify. It also appears inappropriate to exclude the design professional from a process enabling the development of intensified sensitivity to the educators, their program, and the physical requirements of that program. This sensitivity is difficult to attain through the medium of the written word alone. The design process begins as the designer mentally transforms ideas and emotions that develop freely from the committee discussions into abstract form and structure; this feeling for the program is rarely transmitted through the written document.

The designer should maintain a low profile during the initial stages of the educational specification process, acting only as a consultant and observer. After the first two chapters of the document have been written and approved by the board of education, the designer may begin work on schematic-type sketches. These are subsequently examined by the steering committee and revisions are made in the written material, in the sketches, or in both. Frequently, educators have difficulty recognizing unobtrusive problems until an attempt is made to solve the obvious ones. It seems that graphic descriptions often reveal latent problems or alter the original ones completely.

For these reasons, the design professionals should be involved in the development of educational specifications as early in the process as possible. There is really no substitute for the cooperative interaction between intelligent educational planners and talented design professionals.

EDUCATIONAL CONSULTANTS

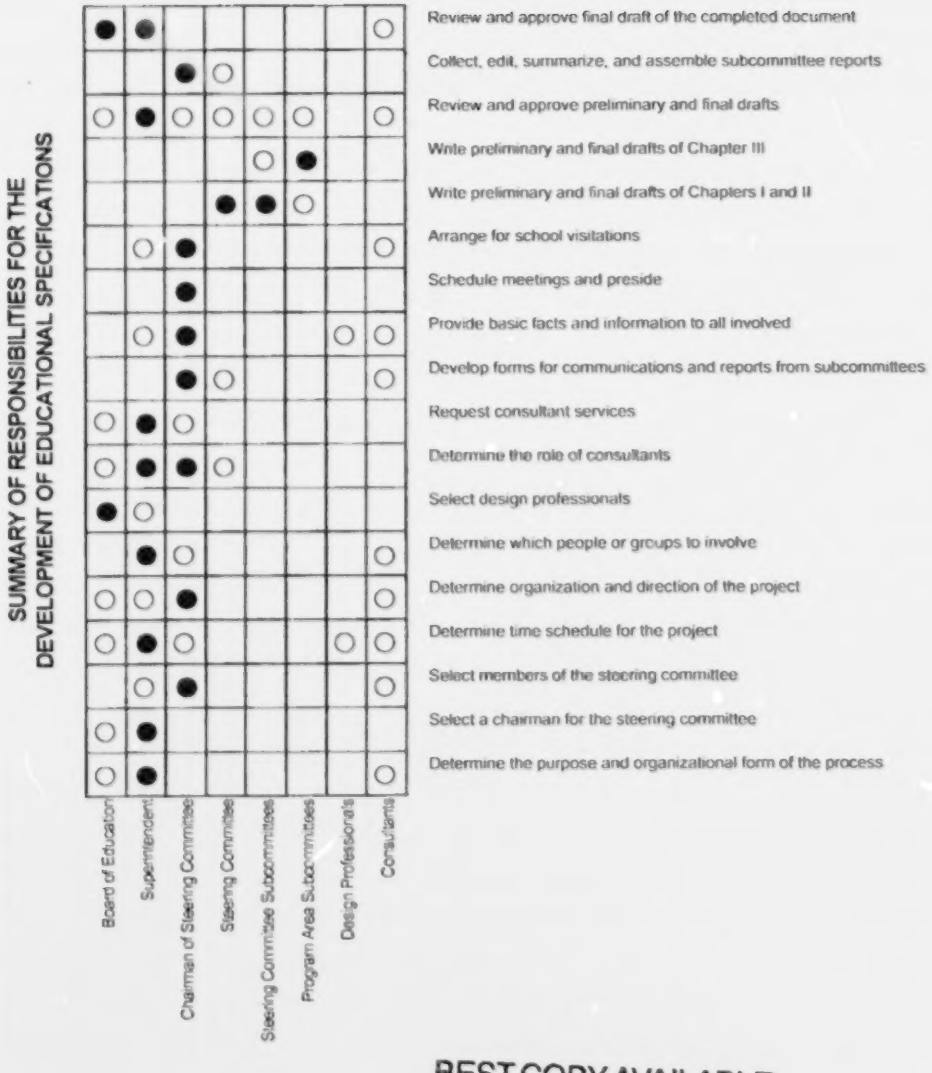
Educational and design consultants available through the North Carolina Department of Public Instruction, from private agencies, or from institutions of higher education may be involved as little or as much as the local unit desires, although, due to reduced staff in recent years, NCDPI consultants can only provide a limited amount of assistance. Consultants who are experienced in the educational specifications process are valuable in offering direction and information to the local educational specifications committee. A further advantage to outside consultants is that they provide a service that should be unbiased and objective. Having seen and worked in many schools in and out of North Carolina, design and educational consultants are abreast of innovative, successful programs and facilities and can provide a fresh approach to problems that may be overlooked by local personnel.

WHAT ARE THE GENERAL RESPONSIBILITIES OF THOSE INVOLVED?

The organization of the educational specification process will, by necessity, differ from situation to situation. Consequently, specific responsibilities and duties also vary. There are, however, a few basic responsibilities that will remain fairly constant throughout the process regardless of the circumstances.

The following chart lists some of these responsibilities and indicates the individual or group that has the primary responsibility for executing each. The chart also indicates the individuals or groups that are normally involved in the execution of each responsibility.

SUMMARY OF RESPONSIBILITIES FOR THE DEVELOPMENT OF EDUCATIONAL SPECIFICATIONS


Board of Education
Superintendent
Chairman of Steering Committee
Steering Committee
Steering Committee Subcommittees
Program Area Subcommittees
Design Professionals
Consultants
Review and approve final draft of the completed document
Collect, edit, summarize, and assemble subcommittee reports
Review and approve preliminary and final drafts
Write preliminary and final drafts of Chapter III
Write preliminary and final drafts of Chapters I and II
Arrange for school visitations
Schedule meetings and preside
Provide basic facts and information to all involved
Develop forms for communications and reports from subcommittees
Request consultant services
Determine the role of consultants
Select design professionals
Determine which people or groups to involve
Determine organization and direction of the project
Determine time schedule for the project
Select members of the steering committee
Select a chairman for the steering committee
Determine the purpose and organizational form of the process
● Primary Responsibilities
○ Involvement

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HOW SHOULD THE EDUCATIONAL SPECIFICATIONS DOCUMENT BE ORGANIZED?

The School Planning Section of NCDPI suggests that the educational specifications document contain three general chapters as follows:

Chapter I: Introduction and Background Information
Chapter II: General Design Considerations
Chapter III: Educational Activities and User Requirements

These three areas provide the architect with the essential information that is necessary to develop an awareness of the educational planning process, a sensitivity to the general needs and values of the educators who will use the facility, and a detailed understanding of the educational program that must be contained and enhanced by the building that is to be designed.

The sequence of the three chapters is logical in that they proceed from the general to the specific. In the process of designing a building, architects also proceed from general concepts (schematic drawings) to general floor plans (preliminary drawings) to more specific technical plans (working drawings). For this reason, the proposed organization seems to be both logical and consistent with architectural procedures.

If the design professionals have been selected by the completion date of Chapters I and II, this information may be approved by the board of education and submitted to the designers to begin developing their architectural program. This procedure will save time in an inflationary era when time is expensive; it will also permit a high degree of designer/ educator interaction as the designers attempt to interpret the educators' general, verbal information into generalized, visible form.

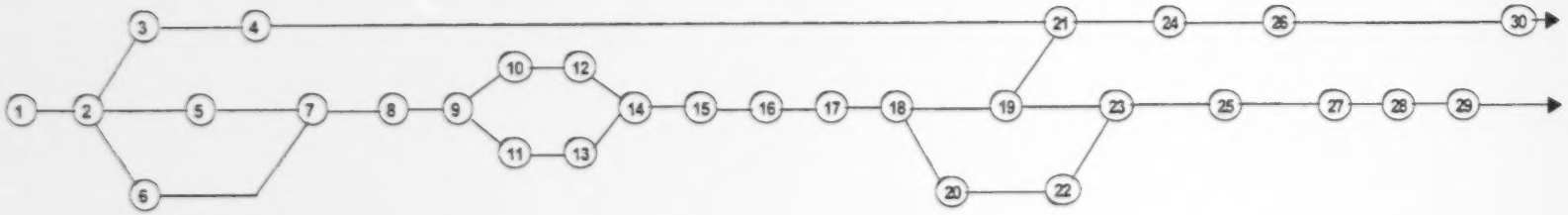
HOW ARE EDUCATIONAL SPECIFICATIONS DEVELOPED?

To suggest that there is only one method for developing educational specifications would be naive. The many variables that influence the process vary from situation to situation. Some of these variables are:

- Time schedule
- Size of the project
- Funds available
- Personalities and competencies of the educational leaders
- Organization of the local central office
- Commitment to educational specifications
- Willingness to accept change
- Commitment to involvement

Not only do these variables differ from unit to unit, but the importance of certain variables may change within a unit after the process begins. Nevertheless, as a point of departure, the following flow chart is provided as one way the process may be organized and proceed. The process is recommended by the School Planning Section of NCDPI with the realization that departures may be necessary and desirable due to local conditions.

SUGGESTED PROCESS FOR THE DEVELOPMENT OF EDUCATIONAL SPECIFICATIONS



1 Superintendent and board of education decide to begin the educational specifications process.
2 Superintendent appoints steering committee chairman.
3 Board of education interviews architects.
4 Board of education selects architect.
5 Superintendent and chairman appoint steering committee composed of staff, teachers, parents, students, consultants, and architect.
6 Superintendent requests assistance of consultants.
7 Steering committee visits, studies, and discusses individually and collectively.
8 As a group, steering committee discusses items relative to Chapters I and II.
9 Chairman appoints subcommittees to write preliminary draft of Chapters I and II.
10 Introduction subcommittee writes preliminary draft of Chapter I.
11 General design subcommittee writes preliminary draft of Chapter II.
12 Introduction subcommittee distributes preliminary draft of Chapter I to other members of steering committee.
13 General design subcommittee distributes preliminary draft of Chapter II to other members of steering committee.
14 Steering committee discusses Chapters I and II and approves or amends them.
15 Alterations are made if necessary and working drafts of Chapter I and II are prepared.
16 Steering committee approves final draft of Chapters I and II.
17 Steering Committee presents Chapter I and II to the board for approval
18 Board of education approves Chapters I and II
19 Board of education presents Chapters I and II to the architect.
20 Steering committee representatives from the various program areas begin work with other faculty on detailed educational activities and user requirements of Chapter III.
21 Architect begins architectural program and schematics.
22 Steering committee representatives from the various program subcommittees complete preliminary draft of Chapter III.
23 Final draft of Educational Activities and User Requirements (Chapter III) submitted to steering committee.
24 Architect submits ideas to steering committee for discussion and approval periodically.
25 Steering committee compiles and presents Chapter III to board of education.
26 Architect submits ideas to School Planning Section of DPI for discussion and approval periodically.
27 Board of education approves Chapter III.
28 Steering Committee combines Chapters I, II, and III into completed Educational Specifications and duplicates.
29 Steering committee presents completed document to board of education and to architect.
30 Architect periodically submits plans to the steering committee, chairman, superintendent, board of education, and School Planning Section of DPI for review and evaluation.

Part II

Part II provides an explanatory discussion of the three chapters that are suggested for the educational specifications document. The information that is suggested for each chapter is not intended to be all-inclusive. The type and volume of information will vary from situation to situation. The information is organized in Part II to coincide with the suggested outline for the educational specifications document. The main subdivisions of the outline are:

Chapter I: INTRODUCTION AND BACKGROUND INFORMATION

- The Planning Process
- The School Community
- Developmental Characteristics of Students to be Served
- General Educational Philosophy

Chapter II: GENERAL DESIGN CONSIDERATIONS

- Budget Limitations
- Initial and Long-Range Student Capacity
- General School Organization
- Flexibility Requirements
- Environmental Atmosphere
- Individuals with Disabilities
- Requirements Common to All Instructional Areas
- Faculty Work Space and Offices
- Community Use of the Facility
- Site Development
- Number of Buses to be Parked on Site
- Additional Requirements

Chapter III: EDUCATIONAL ACTIVITIES AND USER REQUIREMENTS

- Discernible Trends
- Educational Philosophy
- Specific Objectives
- Teaching Methodology
- Main Instructional Areas
  - Capacity (stuidents and/or staff) and number of like areas
  - Student grouping capability of areas
  - Activities
  - Special environmental considerations
  - Media and equipment required
  - Utilities required
  - Storage space required
  - Furniture required
  - Miscellaneous requirements
- Peripheral Areas
- Spatial Relationships
  - Within departments
  - Between departments and special areas

Chapter I

INTRODUCTION AND BACKGROUND INFORMATION

This chapter provides the design professional with general information enabling the development of a sensitivity for the community, for the students to be housed, and for the educational philosophy that must be reflected in the design solution. The following items are useful to the designer and may be supplemented with other information that is appropriate for specific projects.

THE PLANNING PROCESS

This brief statement identifies why the document was developed, how it was developed, and who was involved. Ideally, the architect will have been involved from the beginning. If this is the case, this information may be very brief or even omitted. However, if the designer was not selected early, the planning process should be described in detail.

THE SCHOOL COMMUNITY

A description of the school community may include information concerning its historical background, cultural background, population trends (by age levels), employment characteristics, socio-economic characteristics, educational needs of the community, climatic conditions, general community progressiveness, cultural and recreational facilities available, and an- ticipated community use of the facility.

DEVELOPMENTAL CHARACTERISTICS OF STUDENTS TO BE SERVED

A description of the social, emotional, mental, and physical developmental characteristics is useful to the architect in making decisions regarding the size, colors, dimensions, textures, and shapes. Since there is constant interaction between students and environment and because human relations are so affected by the quality of the environment, environmental factors should be designed to allow the individual to do those things which are appropriate to positive development with a minimum of conflict with the environment or with other individuals.

GENERAL EDUCATIONAL PHILOSOPHY

The introductory chapter should include a system-wide philosophy or statement of beliefs about education. It is imperative that this be accomplished early in the process, as it will color the many decisions which will be made later. It must be noted, however, that a "philosophy" is not an end in itself; it must be used to evaluate every decision and every policy that is made. For instance, how valuable is a commitment to developing self-disciplined and self-directed students if the organization, the teaching methodology, and the curriculum are so structured that students are seldom allowed to weigh alternatives and to make choices? In other words, a statement of philosophy should be functional and active rather than decorative and passive.

Chapter II
GENERAL DESIGN CONSIDERATIONS

The second chapter is intended to be more specific than the introduction and background chapter, while still free of any rigid prescriptions. Basically, this chapter should contain a series of position statements or decisions about the general requirements that must be met in the design of the new facility.

The following information suggests typical items that may be included in this section of the document. The suggested items are by no means all inclusive; there undoubtedly will be additional general requirements that each local steering committee will find appropriate for this section. Neither is it implied that all the items discussed must be included in the treatment of general design considerations.

BUDGET LIMITATIONS

If the board of education has placed a limitation on the cost of the project, this information would appropriately appear in this section of the document.

INITIAL AND LONG-RANGE STUDENT CAPACITY (See Appendix "B")

An estimate of the initial student population to be housed by the new facility, as well as a projection of the future capacity, is necessary. If the board of education has a policy statement regarding the maximum size of schools, it should be referred to at this point.

GENERAL SCHOOL ORGANIZATION

This information should provide answers to such questions as:

- How will the students be advanced through the program from year to year (vertical organization)?
- How will the students be organized in groups (smaller learning environments)
- How will the program and staff be organized? - (By departments; by subject areas; by broader activity areas; or by grade levels)
- Will the organization of one grade or level be substantially different from another?

FLEXIBILITY REQUIREMENTS

The general requirements of flexibility that must be provided for in the new facility should be described. Does the curriculum and instructional methodology call for weekly or daily flexibility in modifying the instructional spaces? Will the program, on the other hand, require the flexibility to modify the spaces and mechanical support system yearly or less often? If the program provides for students to engage in a variety of learning activities with various sized groups, the architect must be so informed so that the concept can be incorporated into the general design of the facility at the beginning.

ENVIRONMENTAL ATMOSPHERE

This paragraph might describe the characteristics of the atmosphere that should exist to maximize the teaching/learning interaction and to enhance the growth and development of the total individual. Once the desired atmosphere has been described, the role that the following basic environmental elements play in producing the desired effect should be discussed:

- Acoustical
- Aesthetics: form, color, orderliness and variety
- Olfactory
- Safety
- Sanitation

- Tactile
- Thermal
- Ventilation
- Visual: lighting, textures, shadows, windows

INDIVIDUALS WITH DISABILITIES

The design professionals must be informed of the total commitment that educators have made for quality education for all students, including those who are handicapped. Ramps, elevators, handrails, etc. shall be provided for the convenience of students who require them. New and renovated buildings must conform to the North Carolina building code and The Americans with Disabilities Act (ADA) requirement for handicapped persons. The Department of Insurance will evaluate the drawings at the various submittal stages to assure full code compliance.

COMMUNITY USE OF THE FACILITY

The degree and nature of community utilization that will be made of the new facility should be described. The location of entrances and exits, security provisions that are required, the spatial relationship of special service areas, the location of parking areas, and the design of the mechanical/electrical support systems are all affected by the off-hours and summer community utilization that is anticipated. Sometimes the local parks and recreation department will share playgrounds and other facilities located adjacent to a school site.

REQUIREMENTS COMMON TO ALL INSTRUCTIONAL AREAS

There will be general requirements that are common in all instructional areas. Rather than having these repeated by each program subcommittee, a statement describing these general considerations in this chapter of the document will prevent duplicated effort. Typical of such common requirements are marker boards, tackboards, clocks, telephones, computers, other communication systems, storage, light and ventilation controls.

FACULTY WORK SPACE AND OFFICES

Early in the program planning for the new facility, a decision should be made relative to the location of faculty work areas. Some faculties prefer a large work area that is centrally located and close to the faculty lounge, professional library, and supply storage area. Others prefer smaller, decentralized office and work areas in the department or grade level centers. Still other schools prefer a combination of the centralized and decentralized approaches. Since this affects the overall design of the facility, the decision should be made early and a position statement included in this chapter of the document.

SITE DEVELOPMENT

All too often, site development is overlooked in the educational planning for a new school. The necessity of play areas, nature trails, outdoor theaters, and outdoor athletic facilities, in addition to a well-maintained and attractive natural environment, have important implications for the design of the facility, its orientation to the site, and the total budget for the project. For this reason, the designer must be informed of the general site development requirements early in the process.

ADDITIONAL REQUIREMENTS

Other general requirements that may be discussed in the General Design Considerations chapter are listed below:

- Student commons area or areas
- Student lockers
- Student circulation: interior and exterior
- Covered bus loading/unloading area
- Covered walk-ways
- Display cases
- Capacity for closed-circuit and educational television
- Vehicular circulation and parking: faculty, students, visitors, bus, delivery, and service vehicles
- Communication systems: networked computers, two-way voice communication systems, distance learning centers, etc.
- Custodial lockers and showers
- Materials receiving areas
- Security Systems/Staff

Rigid prescriptions are restrictive and tend to stifle the architect's creativity in solving design problems; however, general descriptions of the desirable characteristics of these requirements will be beneficial to the architect.

CAUTION!!

Lest the Educational Specifications become just a "wish list" of every committee member involved in the process, avoid presenting impossible-to-afford and/or unrealistic suggestions.

Chapter III
EDUCATIONAL ACTIVITIES AND USER REQUIREMENTS

The third chapter is the most critical, in terms of communicating specific information to the design professionals. If a facility is to be designed that truly enhances the instructional program, the architect must have a thorough understanding of the activities and user requirements of the program that is to be housed. The success with which educators are able to describe the activities that will take place In every area of the facility is critical to the effectiveness of educational specifications.

Architects, not educators, are trained to creatively provide design solutions to fit the activity requirements of a particular educational problem. Past experience has suggested that educators are prone to describe not only the activity but to suggest the solution as well. For example, rather than describing the desired flexibility for modifying the size of instructional spaces to accommodate groups of varying size, educators in the past have attempted to provide a solution to the problem by specifying the use of movable, accordian-type wooden doors, etcetera. Consequently, the architect is limited when perhaps another solution would have been better and less expensive. Words such as carpet, terrazzo, air conditioning, desks, venetian blinds, are all examples of solutions to problems. The fewer words of this type found in the educational specifications the more useful the document will be to the design professional.

The main task for the educator Is to describe In detail the activities that will take place in the school and to describe the desirable conditions under which they should occur. Educators should also describe the type of media and equipment that will be used, as well as the utilities that are needed. The solutions to these needs and conditions should be left to design professionals.

Chapters I and II may be developed by the whole Steering Committee, including staff, parents, students, design professionals, and consultants. Chapter III, however, must be developed by professional educators working in subcomittees representing their areas of specialty. Sample subcommittees for an elementary school and a high school illustrating the various ways these subcommittees may be organized are provided in Appendix "A".

This chapter should be written as concisely as possible by the subcommittees representing grade levels, departments, or program areas, and each of the special service areas. School Planning suggests that coverage of program activities and user requirements may be organized to include the following:

- Discernible Trends
- Educational Philosophy
- Specific Objectives
- Teaching Methodology
- Main Instructional Areas
  - Capacity (students and/or staff) and number of like areas (See Appendix "B")
  - Student grouping capability of areas
  - Activities
  - Special environmental considerations
  - Technology, media and equipment required

- Utilities required
- Storage space required
- Furniture required
- Miscellaneous requirements

- Peripheral Areas
  - Above items as appropriate
- Spatial Relationships
  - Within departments
  - Between departments and special areas

The following discussion provides some amplification of the various items in the suggested outline.

DISCERNIBLE TRENDS

From wide reading, discussions with consultants, visits to other schools, and other sources the faculty subcommittees should identify the major trends in their respective areas. The trends and their implications for the curriculum and the facility should be written as thoroughly, but concisely, as possible.

EDUCATIONAL PHILOSOPHY

The specific philosophy of each faculty subcommittee should be presented briefly to serve as a bench mark against which the following information and future design decisions can be evaluated. The philosophy may be composed of a simple list of the basic beliefs or principles. In any event, it should be as direct and concise as possible without sacrificing quality.

SPECIFIC OBJECTIVES

The subcommittees should describe the specific performance objectives that they hope to accomplish in their area. Observable and/or measurable performance objectives are more valuable in evaluating the program and the facility than broad generalities such as "to encourage . . .", "to develop an appreciation for . . .", and "to acquire an understanding of . . .".

TEACHING METHODOLOGY

Prior to describing the methodology that will be utilized in the new facility, the faculty subcommittees are encouraged to critically evaluate their current methods. Having decided upon the methods that will be employed in the new facility, the sub- committees must accurately describe them to the architect. The space, the electrical /mechanical support systems, and the media required by a teacher who lectures for fifty minutes are quite different from those required when the students are actively involved in student-initiated learning activities in various size groups.

MAIN INSTRUCTIONAL AREAS

School Planning suggests that the following information should be developed as thoroughly as possible for each of the main instructional and support areas. The data should be organized and presented in a brief and concise form with little editorializing. A clear, succinct statement is generally more effective than a long wordy one.

Capacity (students and/or staff) and Number of Like Areas - In this paragraph each subcommittee should indicate the number of main instructional or service areas (classrooms, pods, home bases) that they will require. They should also describe the maximum student capacity that they expect to be in these areas at any one time. This paragraph should also describe the maximum number of staff that will be expected to work in each of these areas. (Refer to Appendix "B").

Student Grouping Capability Of Areas - The amount of grouping will vary appreciably from school to school and within the same school. Therefore, each subcommittee should describe the amount of group variation that the main instructional areas must accommodate. If a great deal of small group activity will occur within an area, there are design techniques that may facilitate the logistics of this methodology. Typical of such techniques are designing flexibility for increasing or decreasing the size of spaces by moving the boundaries; defining smaller areas within larger areas by using different colors, furniture, floor levels, floor coverings, or large graphics on walls; and treating the areas with special acoustical properties to retard sound transfer.

Activities - As thoroughly as possible, the educators should list or otherwise describe the type of activities that will take place in the main instructional areas. In addition to large group activities, care should be taken to describe any simultaneous activities that may occur in small groups in the main instructional areas, since provision for sound abatement and visual barriers may be necessary. The effectiveness of this communication may make the difference between a facility that enhances the Instructional program and one that limits or obstructs the program.

Special Environmental Considerations - Any special environmental requirements such as special illumination, acoustical, or mechanical requirements should be communicated at this point. Typical of such considerations are "black-out" capability in certain areas, sound treatment in music areas, dust collection capability in shop areas, special ventilation in home arts, kiln rooms, or chemistry areas, wet areas in elementary instructional spaces, non-spark light switches in paint areas, visual and acoustical privacy in guidance suite, and special lighting in art areas.

Technology, Media And Equipment Required - Each subcommittee should list or otherwise explain the educational media and/or special equipment that will be required by their particular program. This information is vital in designing the electrical/ mechanical support system for each area. For example, it is much easier and less expensive to design and to wire a facility for computer networks, closed circuit television, etc. in the beginning than to add it later.

Utilities Required - If there are special utility requirements in addition to those implied by the technology, media and equipment requirements, they should be explained at this point in as much detail as necessary. Hot and cold water in the elementary instructional areas, a shower and washer/dryer in the health area, power and data for future computer stations in the classrooms, exterior power receptacles near the outdoor hard-surface play areas, and ample power receptacles in a multi-purpose room are examples of special utility requirements.

Storage Space Required - Special storage requirements (in addition to the normal storage closets, shelves, or lockers) should be described by each subcommittee. Inadequate storage of the proper amount or size is almost always a problem when educators fail to explain precisely what their needs are. It is also helpful to the design professionals to indicate which storage areas are to be open or enclosed, to indicate which ones require security provisions, and also to indicate which storage areas may be used for highly flammable materials.

Furniture Required - A list of furniture to be contained in each instructional area by type and quantity is also helpful to the designer. Brand names should be avoided since they tend to stifle the creativity of the design professional in securing furniture that may be superior to the brand to which you are accustomed. The more thoroughly educators are able to communicate furniture needs, the more likely the facility and the furnishings will complement one another.

Miscellaneous Requirements - There will invariably be special needs from department to department that are not appropriately included at any other place. These miscellaneous considerations may be described at this point in the educational specifications.

PERIPHERAL AREAS

Each program subcommittee should describe any peripheral areas that are required. Traditionally these peripheral areas have been called storage rooms, practice rooms, conference rooms, teacher offices, production and work rooms, multi- purpose rooms, equipment rooms, seminar rooms, audio-visual rooms, and reception areas.

These areas should be described in as much detail as is necessary. The same considerations would apply to peripheral areas as outlined above for the main instructional areas. For the sake of continuity, it is suggested that the outline be adhered to as closely as possible whenever it is applicable to a particular area.

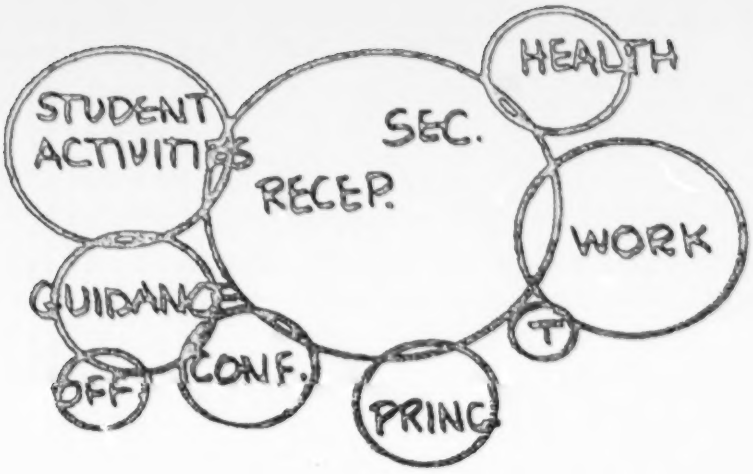
SPATIAL RELATIONSHIPS

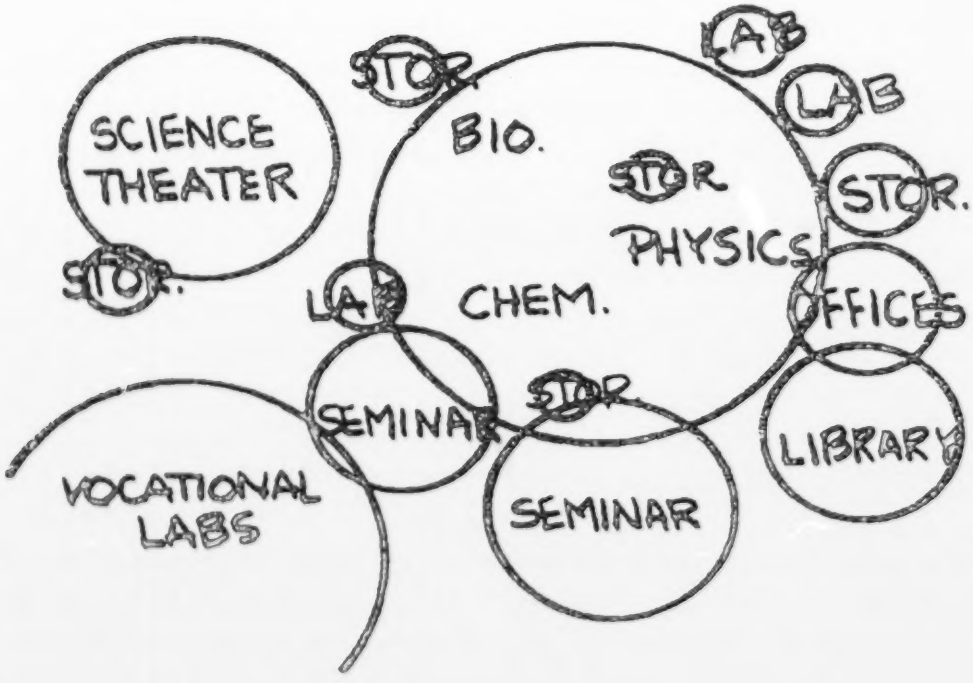
If it is important that the main instructional areas of a sub-committee be adjacent to or near those of another area or near a special service support area, these requirements should be described in this section. It is also important for the design professional to know if there are areas that should be separated for various reasons. Any relationship, positive or negative, should be described. The designer must also be informed of the desired relationship between the main instructional areas and their peripheral areas within a program area.

The relationship of the various spaces **within** a program area, as well as the relationship **between** program areas and the special service support areas, may be summarized verbally or graphically. School Planning suggests the following techniques.

Within Departments - To summarize the desired relationship of the main instructional areas and their peripheral areas **within** a particular program area, an abstract "bubble" drawing is effective and simple to develop. Sample spatial relationship "bubble" drawings are provided for an administration suite and a science department. These examples are intended only to illustrate the technique, not to recommend or suggest the relationships contained in them.

Between Departments And Special Areas - A spatial relationship matrix is suggested for summarizing the desired relationship between organizational units for the entire school. It is suggested that each subcommittee be provided with a blank matrix containing the titles of all the subcommittees (or areas) on the two axes. After each subcommittee has indicated the desired relationship with each of the other subcommittees (or areas), the steering committee should combine the individual matrices into one spatial relationship matrix for the entire school. Sample matrices are provided for an elementary school and for a high school. These are intended to illustrate only the technique and not the relationships within the matrices; the relationships will differ from school to school depending upon the differing philosophies, organizations, and teaching methodologies.





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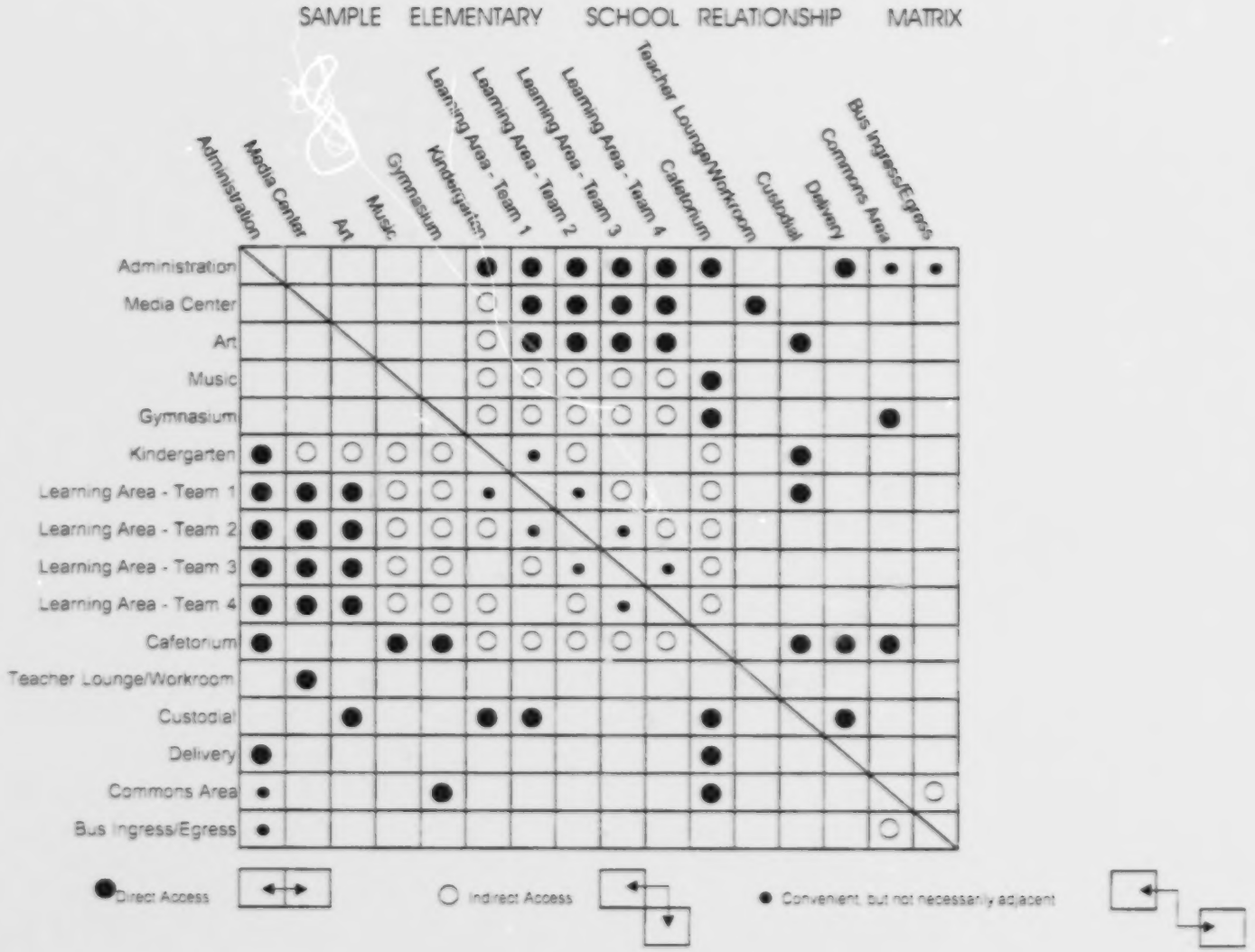
SAMPLE ELEMENTARY SCHOOL RELATIONSHIP MATRIX
Administration
Media Center
Art
Music
Gymnasium
Kindergarten
Learning Area - Team 1
Learning Area - Team 2
Learning Area - Team 3
Learning Area - Team 4
Cafetorium
Teacher Lounge/Workroom
Custodial
Delivery
Commons Area
Bus Ingress/Egress
Direct Access
Indirect Access
Convenient, but not necessarily adjacent

SAMPLE HIGH SCHOOL RELATIONSHIP MATRIX

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APPENDIX "A"

Possible Elementary School Subcommittee Organizations
Possible Secondary School Subcommittee Organizations
Additional Sources

POSSIBLE ELEMENTARY SCHOOL SUBCOMMITTEE ORGANIZATIONS

Pre-Kindergarten Kindergarten Primary Grades Intermediate Grades Exceptional Children	OR	Pre-Kindergarten Learning Area I Learning Area II Learning Area 111 Learning Area IV	OR	Pre-Kindergarten Kindergarten Grade 1 Grade 2 Grade 3

Media Center

Administration

Food Services

Pupil Personnel Services

Transportation

Operation of Plant

Professional Library/Lounge/Work Area/Offices

Technology

Etcetera

POSSIBLE SECONDARY SCHOOL SUBCOMMITTEE ORGANIZATIONS

English Social Studies Foreign Languages	**OR**	Humanities	Humanities
Science		Science	Science
Mathematics		Mathematics	Mathematics
Music (Vocal & Instrumental) Art Drama/Theater Arts	**OR**	Cultural Arts	Cultural Arts Drama
Physical Education & Athletics		Physcial Education	Physical Education

Home Economics Industrial Arts Office & Business Education	**OR**	Practical Arts	OR	Occupational Education
Distributive Education Trade & Industrial Education Agriculture & Horticulture	**OR**	Workforce Development/ Vocational Arts		
Clubs & Activities		Clubs & Activities		Clubs & Activities
Media Center		Media Center	**OR**	Media Center
Faculty Lounge/Library Faculty Workroom/Offices	**OR**	Faculty Center		
Exceptional Classes		Exceptional Classes		Exceptional Classes
Health Guidance	**OR**	Health & Guidance		Health & Guidance
Administration		Administration	**OR**	Administration and Supportive Services
Food Services Transportation Operations & Maintenance Technolgy	**OR**	Supportive Services		
28 SUBCOMMITTEES		**14 SUBCOMMITTEES**		**11 SUBCOMMITTEES**

ADDITIONAL SOURCES:

Guide for Planning Educational Facilities
Council of Educational Facility Planners International

APPENDIX "B"

Planning Data

Optimal Capacity

The optimal capacity for elementary schools is calculated as follows:

Kindergarten classrooms x 21 students* +
1-3 classrooms x 23 students +
4-5 classrooms x 26 students +
Exceptional children self-contained classrooms x 10 students +
Pre-K classrooms x 18 students

Specialized areas, such as art, music, computer labs, gymnasiums/multipurpose rooms and auditoriums, are not added in the capacity formula for elementary schools as these spaces are supplementary (used for pull-outs from the regular classrooms) and not primary teaching stations. Deductions (of 25 per missing teaching station) are made to the capacity when less than minimum facilities for computers, arts education, or physical education are available.

At middle schools, the following formula is used for calculating capacity:

Language arts, social studies, mathematics, and science classrooms x 26 students +
Exceptional children self-contained classrooms x 10 students

This formula considers middle school scheduling whereby students in an entire team often leave their core classrooms during the same one or two periods of the day for special programs. Teams have designated classrooms, but some electives may utilize the regular classrooms during teachers' individual and team planning periods. As at the elementary level, specialized areas are not added in the capacity calculations. Deductions (of 25 per missing teaching station) are made to the capacity when less than minimum facilities for computers, arts education, prevocational, or physical education are available.

In computing the optimal capacity for high schools, the following formula is used:

Regular/science, business education and arts education classrooms x 20 students +
Gym x 2 teaching stations x 25 students per teaching station +
Vocational areas (excluding business) x 15 students per area +
Exceptional children's self-contained classrooms x 10 students

Mobile units are excluded from the total capacity calculations for long-range planning, since these are considered temporary facilities. Mobile units (at 20 per) are included in the gross capacity for student assignment. Small classrooms of less than 600 square feet are generally omitted from the capacities.

Using factors of 21 for kindergartens, 23 for grades 1-3 and 26 for grades 4-5 per classroom for elementary schools, 26 for middle schools, and 20 (+ or -) students per classroom for high schools is based on the BEP recommended class size and does not take into consideration the fact that some classrooms legally exceed these figures. (Current* funding formulas are based on one teacher per 21 students in kindergarten, one teacher per 23 students for regular classrooms in grades 1-2, one teacher per 26 students for regular classrooms in grades 3-9, and 1 teacher

per 28.425 students in grades 10-12.) Capacity is not an exact quantity. It represents an approximate number of students which a building can accommodate efficiently. This should be kept in mind when using these data for the purpose of determining building and budget needs.

Core Capacity

Core capacity is the lesser of the media center capacity or the cafeteria capacity. These spaces cost considerably more to construct than classrooms and may be the limiting factor in a school's capacity. The capacity of the library or media center is calculated on the basis of a minimum standard area in the main room (RLV) of four square feet per student or a minimum of 1,600 square feet.

The capacity of the cafeteria is judged against a minimum standard of 12 square feet per student in the dining area. There are typically three seatings (12 sq.ft. per student/ 3 seatings = 4), thus the dining capacity = the dining area size divided by four square feet per student. Smaller schools may have less than three seatings; using two and one-half seatings approximates continuous seating.

Site

The adequacy of school sites is based on the minimum guideline of 10 acres plus one additional acre for every 100 students at elementary schools, 15 acres plus one additional acre for every 100 pupils for middle schools, 20 acres plus one additional acre for every 100 pupils at junior high schools and 30 acres plus one additional acre for every 100 pupils at high schools. School sites are functional at about 75% of these optimal sizes when properly planned (as in urban locations).

Classrooms

Kindergarten classrooms should meet the minimum size of 1,200 square feet, and primary classrooms (grades one through three) should meet the minimum size of 1,000 aquare feet up to 1,200 square feet recommended. Kindergarten and primary teaching stations should be equipped with adequate storage, work areas, sinks and toilets. Elementary classrooms should meet the minimum size of 850 square feet up to 1,000 square feet recommended and be equipped with adequate storage, work areas and sinks. Likewise, classrooms for grades seven through twelve should have at least 750 square feet up to 850 square feetrecommended. In figuring capacity, classrooms approaching but not meeting these guidelines are counted realizing the necessity of their use in the existing situation.

Specialized Areas

All schools should have classrooms designed for specific purposes. In the elementary school they include: music - a minimum of 850 square feet up to 1,000 square feetrecommended; arts/music or project room for art, science, crafts, etc. - at least 1,000 square feet up to 1,400 square feet recommended; small-group or resource areas for remediation, speech and exceptional children programs - 450 square feet. Elementary schools should also have a multipurpose area for indoor activities.

Middle schools should have many of the same specialized areas listed above; they should also have laboratories and shops for vocational exploration classes and a large multipurpose area or gymnasium.

Most areas in a secondary school are designed for specific purposes. A complete list of recommended elementary, middle, and high school teaching areas and their recommended sizes is included in the North Carolina Public Schools Facilities Guidelines.

Enrollment Projections

The Statistical Research Section of the Department of Public Instruction uses a statistical method based on historical factors called the "Cohort Survival Ratio Method" for projecting future enrollments. The major factors affecting school populations are:

Births -
The number of births is a fairly consistent indicator of future school membership. Kindergarten membership responds rather faithfully to the number of births five years previously. The number of births, the birth rate (births/1000 population), and children per family are used in the projections.

Migration -
Without migration, the number of births would almost perfectly indicate the number of kindergarten students five years later. As a result of migration, however, the kindergarten membership will generally be more or less than the number of births. Migration also affects the number of students as they move from grade to grade. For example, the third grade may have 300 students this year and the fourth grade may have 325 students next year, indicating in-migration.

Retention -
The effects of the dropout rate and students moving to private or charter schools are difficult to quantify. One method of determining the number of dropouts is to compare the number of high school graduates with the eighth graders from four years previously. This method is approximate and does not recognize migration as a contributing factor.

Planners frequently overestimate the impact of new housing and new industry. Industrialists often seek areas with a readily available workforce. With the exception of upper management, the labor force for a new industry will likely be employed locally and result in little in-migration. New housing developments may cause a shift in students within a school system but may result in little change in the total number of students. New subdivisions may have many young children, but as the community matures there will be fewer elementary children each year. More impact would come from new industries that employ highly-paid specialists (e.g. technology) not available in the local workforce or new housing resulting from suburban expansion from adjacent counties.

The Method Used to Project Enrollments

Future enrollment projections for each grade level for each of the next ten years are made each fall based on enrollment information from the previous five years and county birth data from the previous ten years. The following are the factors and ratios that are used:

Birth Rate -
County birth data from the past five years is a very accurate predictor of enrollments for the next five years. Projections of birth rates for the next five years are made using birth rates from the previous ten years. The averaged change (increase, decrease, or stability) in birth rate in prior years is assumed to continue for the next five years. These projections are used to estimate the number of students beginning school five to ten years hence.

Survival Ratio -
The survival ratio is the relationship between the number of births in a county and the number of kindergarten students five years later. If a county had 100 births five years ago and only 75 kindergarten students this year the survival ratio would be 0.75; if there were 100 births five years ago and 125 kindergarten students this year the survival ratio would be 1.25. The survival ratios for the previous five years are averaged using a weighted average that puts more weight on recent years. The number of births each year is multiplied by this average ratio to estimate the number of kindergarten students five years later. This system is also applied to counties with more than one school system by proportioning the total county births to the number of students that enter each school system.

Retention Ratio -
The retention ratio is the relationship between the number of students in a given grade one year and the number of students in the following grade the next year. If there were 100 students in grade three last year and 90 students in grade four this year the retention ratio would be 0.90; if there were 100 fifth graders last year and 105 sixth graders this year the retention ratio would be 1.05. The retention ratios for the past five years are averaged, using a weighted average that gives more weight to recent years. This average retention ratio is then used to project the relationship between each pair of grades (3rd & 4th, 4th & 5th, etc) in the future. These ratios reflect the effects of migration, dropout rates, and students moving to private or charter schools.

Limitations -

1. The system has proved to be highly reliable for large units (over 15,000 students) but less reliable for smaller units. Accuracy for larger units has been within +/-5%, with 69% being accurate to less than +/- 3%; for smaller units (2,000 to 5,000 students) accuracy for 73% of the units has been within +/- 10%.
2. System-wide projections done by the state do not account for shifts in students within a school system. Projections can be done for each attendance area, but must be done by the school system or their consultants.
3. Projections are more accurate for the first five years because birth rates are projected for later years. Projections should be updated every year and monitored for accuracy and trends.

The 2000/01 Public Schools Facility Needs Survey

Every five years local boards of education are required by G.S.115C-521(a) to submit their Facility Needs Assessment (long-range plans) to the State Board of Education.. The 1995 General Assembly of North Carolina authorized the School Capital Construction Study Commission and charged the Commission to conduct a comprehensive study of public school facility needs in North Carolina. Needs documented in that study helped to justify the $1.8 billion state bond issue that was passed in 1996.

The Department of Public Instruction's School Support Division, through its School Planning Section, facilitated the statewide study and tabulated the results for the current survey. Consultative services and technical support were provided in assisting the 117 school systems to identify current and projected facility needs. The Statistical Research Section of the School Business Division provided current ADM and enrollment projections.

A new computer program for evaluating and reporting needs was provided to each unit on a compact disk. The program contains a list of schools, 99/00 ADM for each school, and DPI's membership projections. Typical unit costs and building area standards from the N. C. Public Schools Facilities Guidelines are built into the program. In addition, the program does most of the math as data is entered. The program saves all information to a diskette or to E-mail for reporting. Two summary reports, to verify the electronic data, and a certification are the only paper forms used.

Costs have been standardized statewide to current (2000 $'s) average cost of new construction. There is no allowance for inflation and no attempt has been made to account for regional cost differences. Needs addressed by projects currently under design or construction are not included. This method provides a good overall assessment of needs and relative comparisons. Actual needs for individual school systems may differ from reported amounts.

Building space programs and budget estimates are available to school systems for preliminary planning. These use typical sizes in accordance with state guidelines and recent average costs, but allow customization.

Construction Costs (Sq. Ft. Costs)-

School boards should be wary of claims of very low square footage costs at comparable facilities. Reports of costs by designers and others have often shown only bare construction costs that exclude variable costs such as site work, kitchen equipment, and cabinets and casework. Often the assumption is that these reports include all construction costs and that others have found a way to build for significantly less. These are very serious omissions and cannot be compared with a complete construction budget. For example, site work runs $8 to $10/sq.ft. of building; kitchen equipment is about $2.50 to $3.00/sq.ft.; cabinets and casework $2.00 to $3.00/sq.ft.; gym floor, bleachers, and equipment $2.00/sq.ft. of building; $2.00 to $5.00 for on- or off-site utilities, and more. The total construction budget must also include furnishings and equipment, design and other fees, and land cost.

The complete Facility Needs Report and other publications are available on our website at ***http://www.schoolclearinghouse.org/*** under "Pubs & Guides", including the *N. C. Public Schools Facilities Guidelines*, *Safe Schools Facilities Planner*, and *Making Current Trends in School Design Feasible*.

Publications and Planning Guidelines

School Planning Section
North Carolina Department of Public Instruction
(Available on our web site at http://www.schoolclearinghouse.org)

Publications:

2001 Facility Needs Survey

Updated Facility Needs Cost Summary

School Planning Facility Needs Cost Summary

N.C. Public Schools Facilities Guidelines

Design and Construction Procedures

Safe Schools Facilities Planner

Making Current Trends in School Design Feasible
Small, Walkable and Urban Schools
Smart Growth, Joint Use, Sustainability

Safe, Orderly & Caring Schools Assessment Inventory

K-8 Arts Educational Facilities Planner

9-12 Arts Education Facility Planner

School Site Facility Planner

Science Education Facilities Planner

The Development of Educational Specifications

Planning Guides and Forms:

Feasibility and Cost Analysis Form
(Submit when a new school building replaces an older school building)

School Capacity Worksheet

School Capacity Summary

PK-5 Typical Space Profiles

K-5 Typical Space Profiles

PK-8 Typical Space Profiles

Middle School Typical Space Profiles

High School Typical Space Profiles

Handbook for Public Playground Safety
(published by the US Consumer Produce Safety Commission)

Early Childhood Facility Planner

Exceptional Children Facility Planner

Engineering Checklist for Public School Facilities

"The New Design Handbook for School Food Service" No. EX11-95 from the National Food Service Management Institute. Cost $25.00

New and Revised Publications Currently Under Development:

"Energy Guidelines for NC Public Schools"

"School Bus Maintenance Facility Planner"

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

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